

Professional development requirements for talented leaders in the economic field: Evidence from Saudi Arabia



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ABSTRACT

This study aimed to develop and validate a domain-specific scale to identify the professional development requirements associated with talented leaders in the economic field and to examine how these requirements vary across selected demographic and career variables. The study employed a descriptive cross-sectional survey design. Participants were economic leaders in Saudi Arabia from companies listed by the Capital Market Authority (CMA). Data were collected using a questionnaire developed by the authors to measure leadership development requirements. Psychometric evaluation supported a four-dimensional structure: environmental and social influence, personal skills and leadership traits, internal motivation and self-development, and innate aspects and career opportunities. Cluster analysis revealed distinct leadership development profiles. These included leaders who were shaped and developed through early upbringing, academic formation, and experiential learning. Binary logistic regression indicated statistically significant differences based on age and years of professional experience. However, gender, educational level, and number of job transitions showed no significant effects. These findings provide an initial measurement-based framework to support targeted professional development planning in economic leadership contexts.

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1. Introduction

Nowadays, leadership is thought of as one of the high-level forms of talent expression due to a variety of reasons. It involves sustained influence and complex problem-solving. It also requires a coordination of people and resources toward common goals. Research on both giftedness and organizational psychology points to the fact that exceptional leadership performance is not a single fixed trait. Recent studies show that leadership emerges gradually as people build relevant skills through experience (Day, 2000; Mumford et al., 2000). When considered from a talent development viewpoint, leadership can be seen as a manifestation of realized talent. Here, we look at leadership as emerging through interactions among individual

qualities, psychosocial resources, and environmental opportunities (Subotnik et al., 2011).

The theory of talent development argues that excellence does not appear suddenly; it develops. That is, it is produced by a developmental process. According to the talent development megamodel, early abilities and competencies are transformed into later achievement. This model also shows that for some individuals, these abilities grow into eminence. In this respect, psychosocial skills and contextual supports become more important as individuals move toward advanced performance (Subotnik et al., 2011). The developmental systems approach shares the same belief. They argue that talent cannot be understood without considering the evolving interaction between both a person and their environment over time (Dai, 2017). This way of thinking aligns strongly with leadership development research. Studies here show that leadership effectiveness is not influenced by static personal traits alone. Instead, it is shaped by experience accumulation, mentoring, feedback, and more challenging roles (Day et al., 2014).

When we study the development of leadership talent, the economic domain as well as the managerial field offer a significant context. The

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significance of this setting is attributed to the fact that leadership outcomes are continuously evaluated. This evaluation is carried out through organizational performance, market constraints, and accountability measures. Saudi Vision 2030 makes this more relevant and important. Under this vision, Saudi Arabia's economic transformation agenda places clear emphasis on building national capabilities and leadership capacity to support diversification and sustainable growth. Economic leadership development in this context becomes an organizational priority and, more importantly, a strategic national concern. Therefore, it is high time to examine the development requirements that are associated with talented leaders operating in such environments.

Although there is a growing interest in the topic of leadership development, several critical gaps remain. We first observed a lack of validated measurement instruments that are designed to assess professional development requirements among economic leaders from the specific point of view of talent development. Existing instruments are found to have largely been developed and designed for general leadership competencies. Furthermore, these tools, including the models of talent development, seem to focus on the educational domain and ignore the economic sector. Additionally, the pathways through which talented economic leaders develop appear to be empirically underexamined. There is also no clear understanding of how factors like age, experience, gender, and education can predict leadership development in economic settings, particularly in Saudi Arabia. Most important of all, one cannot deny that conceptual clarity remains a real challenge. In other words, one of the difficulties in studying leadership is that people use this term to mean different things all at once: ability, potential, attainment, and outcome. These gaps are significant for a number of reasons. They limit the ability of organizations and policymakers to design evidence-based and context-sensitive leadership development programs. They also hinder the development of leadership initiatives that suit the national economic goals.

The motivation for this study emanates from the need to address these gaps. The present study responds to these concerns in that it develops and tests a tool to measure the professional development needs of talented economic leaders. It also explores how these requirements differ based on specific personal and career factors. Moreover, the study adopts the lens of talent development. This lens makes a clear distinction between the leadership manifestations observed in professional contexts and the psychosocial and contextual factors that support their emergence and sustainability. This distinction supports a coherent basis for measurement and interpretation. This is an essential requirement for instrument development as well as for the disciplined use of multiple analytic approaches.

The study is guided by the following research questions:

- What is the underlying dimensional structure of professional development requirements for talented Saudi economic leaders?
- Do factors like age, gender, educational level, years of professional experience, and number of job transitions predict leadership development outcomes among talented economic leaders in Saudi Arabia?
- Are there developmental pathways through which leadership capabilities are formed?

The significance of this study lies in its theoretical extension of the current frameworks of talent development to economic leadership. The study methodologically provides a validated instrument for future research and assessment. Moreover, this study offers practical guidance for differentiated professional development that aligns with the Saudi Vision 2030.

This paper is structured as follows. Following this introduction, this research presents the theoretical framework, literature review, and methodology. The results, discussions, and conclusion are presented in the subsequent sections.

2. Literature review

2.1. Dynamic talent development models and their relevance to leadership

Giftedness research has undergone a major shift. Researchers used to deal with talent from a static identification point of view. They have recently moved to look at giftedness from the perspective of talent development. This new approach emphasizes progression across stages and the increasing role of psychosocial and contextual factors in advanced performance (Subotnik et al., 2011). Dai (2017) took this further and argues for understanding talent development through evolving person–environment systems. According to this developmental systems theory, talent development is a process of continuous adaptation and restructuring rather than linear accumulation. These models are compatible with the theory of leadership development. The theory posits that leaders are not made overnight. In other words, leadership competence is developed through progressive challenges, feedback, learning from others, and organizational contexts (Day et al., 2014).

Recent studies have further strengthened this developmental perspective. They have pointed out that talent development is a process of progression, continuous monitoring, and alignment between the capabilities of individuals and their contextual opportunities (Merello, 2025). Contemporary frameworks have particularly highlighted that we need to distinguish between the manifestations of talent and the developmental processes that support them.

This differentiation is necessary and relevant for this study as it helps us to understand leadership as a product of continuous growth and development. Moreover, recent implementations of frameworks regarding talent development have emphasized structured support systems and long-term investment in the cultivation of psychosocial skills. These elements are crucial in the process of converting potential into professional achievement (Olszewski-Kubilius and Thomson, 2015).

In spite of these advances, a critical limitation remains with regard to such models of talent development. It is noticed that these models have been more frequently applied to gifted individuals in the educational domain than to leadership in economic and managerial sectors. Therefore, there is a need for conducting empirical studies to extend these frameworks to professional leadership contexts. This need is more significant in Arab environments, such as the Saudi context, where developmental pathways may differ.

2.2. Resource and context perspectives

The actiotope model offers a useful lens here. This model suggests that excellence takes place when both exogenous and endogenous resources are available and mobilized. It also conceptualizes development through interacting forms of “capital” that support learning and performance (Ziegler et al., 2019). This resource-based view gives us a theoretical basis that can be used for assessing environmental and contextual conditions that facilitate sustained leadership development in those complex economic systems.

This perspective has been recently extended. Studies have highlighted that talent development is a dynamic system. Individual agency in this system interacts with access to opportunities, institutional support, and organizational culture (Merello, 2025). These insights reinforce the argument that leadership development ought to be analyzed within broader socio-organizational contexts. That is, leadership development cannot be explained by the mere analysis of individual traits. Furthermore, when reviewing leadership development literature, we find that studies emphasize the importance of organizational environments. These settings are seen to play a decisive role in enabling or constraining leadership growth, particularly in economic systems that are witnessing rapid change (Analyn, 2023).

2.3. Leadership development in economic and managerial contexts

The previous literature on leadership development distinguishes between individual knowledge, skills, and capacities that are elements of leader development and leadership development encompassing the collective and relational processes within systems. It also highlights that mentoring, experience, and organizational opportunity

structures shape leadership outcomes (Day et al., 2014). Leadership in managerial settings is also strongly linked to the demands of social judgment and complex problem-solving skills. These capabilities require cumulative development over time (Mumford et al., 2000). These perspectives support the present study's focus on professional development requirements. That is to say, they do not treat leadership status alone as evidence of talent.

In recent empirical and conceptual work, there appears to be a call for new direction. Researchers now argue that we need to move beyond static competency models. They urge that leadership studies should espouse approaches that are more behaviorally grounded and sensitive to contexts (Banks et al., 2023). This point of view represents a shift in terms of how we look at leadership. It specifically shows an acceptance among researchers that internal traits are not the only factors that affect leadership. According to these modern views, leadership emerges through observable behaviors, and these behaviors are, in turn, influenced by the demands of situations. Contemporary assessments add further insight to this belief. These reviews stress that leadership development in organizational settings is most effective when embedded within broader systems. These include organizational learning, mentoring, and strategic alignment (Analyn, 2023).

However, one will not fail to notice an important gap here. It is observed that few studies have clearly incorporated frameworks of talent development with leadership development in economic contexts. This gap limits our understanding of how psychosocial skills and contextual resources interact to produce leadership performance in complex economic environments.

2.4. Leadership, creativity, and innovation

Workplace research indicates that leadership is strongly associated with creativity and innovation at multiple levels. This link specifically appears at the levels of individual, team, and organization. Meta-analyses confirm the existence of strong linkages between leadership styles and creative or innovative outcomes. This reinforces the need to include psychosocial and contextual dimensions when studying leadership development in those environments that are driven by performance (Hughes et al., 2018; Lee et al., 2020).

The discussions in leadership research add another point. It suggests that the outcomes of innovation depend to a large extent on leadership style and the leaders' developmental trajectories. They also rely on the ability of leaders to integrate cognitive, social, and contextual resources over time (Banks et al., 2023). A key idea emerges here. We should examine leadership development as a dynamic process; this implies the need to avoid treating it as a static set of competencies.

2.5. Retrospective accounts and the narrative fallacy

A large amount of talent and leadership literature relies on retrospective explanations of success. Many studies ask successful people to tell their stories. This can introduce the narrative fallacy, as these people may tend to impose coherent causal stories on complex outcomes after they have occurred (Taleb, 2007). This limitation is especially relevant in economic leadership contexts. In this respect, the factors of survival, timing, and opportunity structures may influence outcomes in ways that are not fully visible in retrospective accounts. These concerns have been reinforced in recent methodological discussions. Studies have called for more transparency, rigor, and replicability in organizational research. These requirements are of higher importance when we attempt to study elite populations such as leaders (Aguinis and Solarino, 2019). These critiques raise a concern here. They highlight that retrospective self-reports are more likely to overemphasize individual agency. They may even underrepresent contextual and "stochastic" influences. Therefore, we come up to the conclusion that there is a greater support for measurement-based and systematic approaches. Such methods are considered useful as they reduce bias and improve the reliability of findings in leadership research.

The present study mitigates this limitation. It prioritizes a measurement-based approach to identify development requirements reported by leaders, while avoiding causal claims that exceed the study design.

2.6. Linking theory to measurement

The above literature review supports the necessity of constructing an instrument that can capture both manifestations and developmental enablers. Consequently, we have translated the constructs derived from talent development models and leadership development research into four measurable domains. These domains represent: a) environmental and social influences, b) personal leadership capacities, c) internal motivation and self-development orientation, and d) opportunity and career-structure conditions. This theory-driven strategy used in this research is useful because it strengthens the alignment between the conceptual framework, instrument development, and empirical analyses.

2.6.1. Study aim and focus

The primary objective of this study is to develop and psychometrically validate a domain-specific scale for measuring the professional development requirements associated with talented economic leaders. The validated dimensions are then used to describe profiles and test associations with demographic and career variables (e.g., age and

years of experience) within a Saudi economic leadership sample. In this paper, leadership is treated as a domain-specific manifestation of professional excellence within the economic field. The current study does not deal with leadership as a general trait or "potential." Accordingly, the analyses are organized to achieve two goals. The aim of these is to establish the scale's dimensional structure and reliability, and then to examine how those dimensions relate to leadership development pathways and predictors within the study sample.

2.6.2. Conceptual definitions and theoretical frameworks

The current study uses clear definitions that align with contemporary models of talent development. These definitions are introduced in order to avoid conceptual overlap and definitional ambiguity. We begin with talent, which is defined as a domain-specific capacity that develops over time through sustained learning, practice, and opportunity. As highlighted already, talent is not treated as a fixed trait. Instead, there is a tendency to see leadership as a developmental potential that is shaped by both intrapersonal factors and environmental influences (Subotnik et al., 2011).

Leadership in the economic domain is understood as a domain-specific manifestation and the outcome of talent development. It is expressed through sustained responsibility, influence, and decision-making within economic and organizational contexts. In this study, the term "leadership" is treated as a manifestation of realized talent; it is not viewed here as leadership "potential." This view is consistent with the principle proposing that advanced performance is determined by developmental experiences and contextual demands (Subotnik et al., 2011).

Psychosocial skills are defined as developmental enablers. Their purpose is to facilitate the transformation of talent into stable leadership manifestations. These skills include motivational resources, self-regulation, adaptability, social competence, and learning orientation. Such capabilities are widely considered to be critical for high-level performance and sustained excellence (Dai, 2017; Subotnik et al., 2011).

The study integrates Merello's (2025) three-perspective framework so that we can sharpen the distinction between outcomes and enablers. It specifically adopts the separation between manifestations (D) and developmental enablers (De). Within this theoretical logic, leadership outcomes in the economic field are positioned as manifestations (D). With regard to psychosocial skills, they operate here as developmental enablers (De) supporting their emergence and maintenance. This structure also adheres to the talent development megamodel. This model of talent development emphasizes that the role of psychosocial skills and environmental supports becomes important when individuals

progress toward advanced professional achievements (Subotnik et al., 2011).

In this study, talent refers to a domain-relevant capacity that can be developed over time through interactions between personal and contextual resources. Leadership (in the economic field) is treated as a domain-specific manifestation of talent development expressed through professional attainment and sustained performance in economic and organizational roles. Psychosocial skills refer to the learned and dispositional resources (e.g., self-regulation, motivation, social-relational capacities) that enable, support, and stabilize leadership manifestations over time. This distinction is important to avoid conflating leadership as an outcome and a manifestation with the enabling resources that contribute to leadership development.

3. Methodology

This study employed a descriptive cross-sectional quantitative design to examine the professional development requirements associated with talented leaders in the economic field. A cross-sectional survey approach was selected as it allows for the systematic collection of standardized data from a defined population at a single point in time. The approach also facilitates both psychometric evaluation of a newly developed measurement instrument and the examination of associations between leadership development dimensions and selected demographic and career-related variables. It should be pointed out here that this design is appropriate for scale development and exploratory modeling in applied leadership and talent development research. Unlike other designs commonly used in leadership research, the approach that has been used in the present study prioritizes measurement validation and pattern identification. These approaches remain underexplored in economic leadership contexts.

The study was conducted in the Kingdom of Saudi Arabia. It specifically targeted leaders working in companies listed under the Saudi Capital Market Authority (CMA). The CMA listing included 385 companies at the time of data collection: 268 companies in the Main Market and 117 companies in the Parallel Market (Nomu). These companies represent a broad range of economic sectors. These include finance, industry, services, energy, retail, and technology. The CMA-listed environment was selected due to its representation of a regulated and competitive economic context in which leadership performance and professional development are closely linked to organizational outcomes and market demands.

Participants were individuals who occupy leadership or senior decision-making roles within those companies that are listed under CMA. The eligible participants included managers, executives, and directors. They generally included individuals with formal leadership responsibilities related to

economic, strategic, or organizational decision-making.

A purposive sampling strategy was used to identify participants who met the inclusion criteria. This was then followed by snowball sampling to reach additional eligible leaders within the same professional networks. This approach was necessary due to the limited accessibility of senior economic leaders. Such an approach is commonly used in leadership and executive research. However, it is important that we acknowledge a limitation here; purposive and snowball sampling may limit the generalizability of the findings. The sample may not represent all economic leaders in Saudi Arabia. Sections 5.6 and 5.7 explain in detail the methodological boundaries and limitations of this study.

Recruitment efforts were extended across multiple companies and sectors. To mitigate concentration bias, the researchers monitored the organizational distribution of respondents during data collection and ensured that no single organization contributed more than 10% of the final sample. These recruitment strategies were followed so as to mitigate potential sampling bias. Participation was voluntary. No financial or professional incentives were offered to participants.

The required sample size of the current study was calculated based on the total population of leaders across the 385 CMA-listed companies. The researchers used the Richard Geiger equation to estimate the minimum sample size that is required to achieve adequate representation and statistical power. Based on this calculation, a minimum sample size of 196 leaders was determined, and it was considered to be sufficient for the purposes of factor analysis, regression modeling, and cluster analysis. The final sample ensured adequacy for the planned statistical analyses as it met or exceeded this threshold.

A questionnaire was developed by the researchers. It was designed to measure the professional development requirements of talented leaders in the economic field. Instrument development was guided by the contemporary frameworks of talent development and leadership. It included dynamic models of talent realization and psychosocial skill development in professional contexts.

The initial version of the instrument consisted of 48 items organized across two broad axes. These reflected internal requirements: personal, motivational, and skill-based factors. The external requirements, such as environmental, social, and opportunity-related factors, were also reflected. All items were rated on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." Higher scores are an indication of a stronger endorsement of the development requirement.

The instrument (questionnaire) that was used in this study underwent review and refinement. A panel of experts who were specialized in the fields of leadership, educational psychology, and economics

evaluated this questionnaire. They then provided their feedback accordingly. The subject matter review was conducted in order to establish content validity. Items were refined to ensure the clarity, relevance, and conceptual alignment of the questionnaire. This refinement was made based on expert feedback. Psychometric evaluation through exploratory and confirmatory factor analyses subsequently supported a multidimensional structure that represented the main domains of leadership development requirements.

Data were collected using a self-administered questionnaire that was distributed electronically to eligible participants. Invitations included an information sheet that explained in detail the purpose of the study, confidentiality assurances, eligibility criteria, and estimated completion time. Participants completed the questionnaire anonymously. They submitted their responses electronically. Data collection was conducted over a defined time period so that we could ensure consistency in contextual conditions.

Data were screened prior to analysis so as to ensure accuracy, completeness, and plausibility. Missing data were examined at the item level. This was done to assess the extent and pattern of missingness. Dimension scores were calculated using available item responses. This calculation was made when missing responses were minimal and confined to individual items within a scale dimension. Cases with missing data on more than 20% of items within any single scale dimension were excluded from analyses requiring complete data. In total, seven cases were excluded on this basis. The purpose was to minimize bias while preserving sample size for other analyses. The final analytical samples were 113 (pilot) and 196 (main study).

The researchers conducted data analysis using a stepwise analytical strategy in alignment with the objectives of the current study. First, exploratory factor analysis (EFA) was performed using principal component extraction and rotation. The aim of using the EFA was to examine the underlying structure of the instrument. EFA was also performed to assess factorability through the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s test of sphericity. Second, higher-order factor analysis and confirmatory factor analysis (CFA) were applied to test the measurement model. They were also used to evaluate construct validity using standard fit indices.

Internal consistency reliability was assessed using Cronbach’s alpha coefficients and item–total correlations. Binary logistic regression analysis was subsequently used. It examined the associations between leadership development dimensions and selected demographic and career variables: age and years of experience. Finally, cluster analysis was employed to identify distinct leadership development profiles within the sample.

The researchers built a quantitative instrument (questionnaire) using a five-point Likert scale. The questionnaire consisted of 48 items that were distributed across two axes.

The study instrument was applied to a pilot sample of a total of 113 individuals. Scale validity was ensured through the following methods.

Content validity: Face validity was achieved through presentation to arbitrators. The scale was presented to 8 faculty members who were specialized in Talented Education, Education, and Psychology.

Factorial validity: A quantitative questionnaire was developed to assess professional development among economically talented leaders. The instrument employed a five-point Likert scale. It initially involved 48 items distributed across two conceptual axes. The scale was administered to a separate pilot sample of 113 participants in order to examine its psychometric properties and to conduct the Exploratory Factor Analysis (EFA). The main study sample of 196 participants was distinct from the pilot sample and was used exclusively for the Confirmatory Factor Analysis (CFA) using AMOS 25. This separation of samples for EFA and CFA follows recommended practice for scale development and validation.

Content validity was established through expert review by eight faculty members specializing in gifted education, education, and psychology. These experts evaluated the relevance and clarity of the items. Minor revisions were made according to their feedback.

EFA was conducted to examine the underlying factor structure. The data were suitable for factor analysis, as indicated by a satisfactory Kaiser–Meyer–Olkin value ($KMO = 0.812$) and a significant Bartlett’s test of sphericity ($\chi^2 = 3192.109$, $p < 0.001$). Ten initial factors were extracted through the use of principal component analysis with Varimax rotation. A subsequent second-order factor analysis yielded four higher-order dimensions. These represented environmental and social influences, personal leadership skills, internal motivation and self-development, and innate characteristics and career opportunities.

CFA was then performed using AMOS 25 to validate the proposed four-factor structure. Multiple fit indices indicated an acceptable to good model fit ($CMIN/DF = 1.80$, $CFI = 0.93$, $GFI = 0.91$, $RMSEA = 0.055$). These supported the adequacy of the measurement model.

The researchers used the pilot sample of 113 leaders drawn from outside the main study sample to conduct the EFA and to examine internal consistency validity. The main sample of 196 leaders was used separately for the CFA. Pearson’s correlation coefficient in SPSS was used for the calculation of item–total correlations. The correlations between the items of the first dimension and the total scale score ranged from 0.497 to 0.679. Those of the remaining dimensions ranged from 0.278 to 0.725. All correlations were statistically significant at the 0.01 level. This indicates satisfactory internal consistency for the scale and its dimensions. As far as scale reliability is concerned, it was assessed by using the method of Cronbach’s

alpha and the split-half. Cronbach's alpha coefficients for the scale dimensions ranged from 0.828 to 0.884, with an overall alpha of 0.955. This result demonstrated excellent internal reliability. Regarding split-half reliability, it was calculated by correlating odd- and even-numbered items and adjusting for test length using the Spearman-Brown and Guttman formulas. The Spearman-Brown coefficients for the dimensions ranged from 0.787 to 0.841, and the Guttman coefficients ranged from 0.782 to 0.841. For the total scale, reliability coefficients reached 0.899 (Spearman-Brown) and 0.897 (Guttman). These numbers confirm a high level of reliability for the instrument.

4. Results

In Table 1, we can find an uneven gender distribution. This imbalance may be considered to be a reflection of the patterns of the labor market in the sector under study. The ages of participants ranged from 20 years to >50 years, with the largest proportion in the 41–50 age group (41.3%). This tells us that the sample largely represents the leaders who are in middle to later stages of their careers. Most participants held a bachelor's degree (62.2%). In addition, 65.3% reported more than 15 years of experience, indicating substantial professional exposure. Finally, 80.1% reported 1–3 job transfers. This indicates relatively stable career trajectories within the sample.

4.1. Analysis of questionnaire items

Overall, participants agreed on the importance of various factors that influence the formation of the leadership personality. There was a high level of agreement, as the total mean was (4.26) with a degree of "strongly agree." The results also show that the study participants clearly tend to value personal skills and abilities such as social

intelligence and perception as main factors in leadership development. However, there is variation in opinions concerning some factors that are related to family background and genetics. This lack of consensus indicates differing viewpoints on the role of heredity and family environment in shaping the leadership personality.

Table 1: Demographic characteristics of the study participants (N = 196)

Variable	Category	n	%
Gender	Male	152	77.6
	Female	44	22.4
Age	20–30	16	8.2
	31–40	44	22.4
	41–50	81	41.3
	>50	55	28.1
	Pre-university	17	8.7
Educational level	Bachelor's	122	62.2
	Master's	39	19.9
	Doctorate	18	9.2
Years of professional experience	1–5	14	7.1
	6–10	20	10.2
	11–15	34	17.3
	>15	128	65.3
	1–3	157	80.1
Number of job transfers	4–6	29	14.8
	7–10	9	4.6
	>10	1	0.5

4.2. Results of binary logistic regression

As shown in Table 2, the results of the binary logistic regression analysis showed that the proposed model reached overall statistical significance, as confirmed by the Chi-square test ($p < 0.001$). However, the pseudo- R^2 values ($R^2_{McF} = 0.095$; $R^2_N = 0.142$) indicate that the model accounts for only a modest proportion of the variance in the leadership development outcome. These values reflect limited explanatory power, meaning that the demographic and career variables included in the model explain a relatively small share of what distinguishes leaders who developed from those who did not. This should be borne in mind when interpreting the individual predictor effects below.

Table 2: Binary logistic regression model fit (N = 196)

Model	χ^2	df	p	McFadden R^2	Nagelkerke R^2	AIC	Deviance
1	26.32	5	< 0.001	0.095	0.142	265	250

To examine the individual contribution of each predictor, omnibus likelihood ratio tests were conducted. Omnibus likelihood ratio tests showed that age and years of professional experience were significant predictors, whereas gender, educational level, and number of job transfers were not (Table 3).

Table 3: Omnibus likelihood ratio tests for predictor effects

Predictor	χ^2	df	p
Gender	0.51	1	0.471
Age	6.87	1	0.008
Educational level	1.34	1	0.247
Years of professional experience	5.62	1	0.018
Number of job transfers	0.39	1	0.528

When looking at the individual effects of the independent variables, it was found that age and

number of years of professional experience were two statistically significant variables in predicting talent development. As shown in Table 4, age had a positive and significant effect ($\beta = 0.486$, $p = 0.008$, $OR = 1.626$). The data showed that older individuals have a higher probability of talent development compared to younger individuals. Similarly, the factor concerning years of professional experience showed a positive and significant effect ($\beta = 0.378$, $p = 0.017$, $OR = 1.460$). This means that an increase in years of professional experience is linked to an increased probability of talent development.

On the other hand, other variables like gender, educational level, and number of job transitions were not statistically significant. This result suggested that these factors did not have a

clear effect on the probability of talent development in the studied sample. Based on these results, age and years of professional experience show statistically significant but modest associations with leadership development outcome. While the odds ratios (OR = 1.626 for age; OR = 1.460 for experience) are in the expected direction, the low

pseudo- R^2 values indicate that these predictors alone explain only a small proportion of the variance. This pattern is consistent with the view that experiential accumulation contributes to leadership development, though many other factors not captured in this model are likely also at play.

Table 4: Logistic regression parameter estimates

Predictor	SE	Z	p	Lower 95% confidence interval	Upper 95% confidence interval	Odds ratio estimate
Gender	0.127	0.364	0.729	0.346	2.326	1.137
Age	0.486	0.183	0.008	0.003	2.336	1.626
Educational level	0.215	-0.186	0.247	0.561	1.168	0.808
Years of professional experience	0.378	0.159	0.018	1.071	1.990	1.460
Number of job transfers from one job to another	0.112	-0.218	0.514	0.561	1.434	0.897

4.3. Cluster analysis for identifying patterns of leadership development among talented leaders in the economic field

The researchers applied hierarchical cluster analysis using the Jamovi program. The purpose of applying this technique was to group individuals based on their responses to a number of variables that measured family, educational, social, and psychological aspects related to the formation and development of the leadership personality.

The Ward.D2 method (Murtagh and Legendre, 2014) was used to measure linkage, and Euclidean Distance was used to measure the degree of similarity between individuals. The analysis showed that the sample divided into three main groups or clusters. The cluster analysis helped us to identify distinct patterns regarding the formation of leadership qualities. These patterns reflected a temporal difference in their stages of development, according to a set of varying indicators. They are described as follows:

4.3.1. Cluster one: Leaders through early upbringing

This cluster was distinguished by a noticeable rise in participants' scores on those factors that are associated with family support, early responsibility-taking, intellectual independence, role models within the family, and early business practices. This can be considered an indication that leadership qualities began to crystallize in leaders during early stages of life, through family and social environments stimulating responsibility-taking and decision-making.

4.3.2. Cluster two: Leaders through the academic path

This group was marked by high scores on variables associated with professional mentoring, higher studies, scholarships, institutional openness, and trust in authorities during the academic path. These results confirm that leadership qualities developed later in leaders, gradually, through educational and professional institutions that

provided opportunities for cognitive and behavioral growth in systematic and organized environments.

4.3.3. Cluster three: Leaders through field and experience

This cluster showed high scores on factors including volunteer work, diversity of experiences, community engagement, and openness to different environments. We can understand from this that the formation of leadership qualities in leaders resulted primarily from practical interaction and direct experience in the field, as well as through family or academic education.

4.4. Interpretation of results: descriptive profile patterns in leadership development

The temporal framework that we present here is an interpretation derived from the observed profile patterns (cluster results) and the measured scale dimensions. It does not establish causality or developmental ordering. Instead, it proposes certain pathways that can be explored in future longitudinal studies.

The cluster analysis suggests that leadership development among talented economic leaders does not follow a single uniform profile. It rather reflects distinct developmental patterns. Specifically, cluster one "Leaders through Early Upbringing" describes a profile in which early family socialization, responsibility-taking, and early exposure to business practices are reported as prominent influences. The second cluster, "Leaders through the Academic Path," describes a profile in which structured educational experiences, mentoring, scholarships, and institutional trust are rated highly. The third cluster, "Leaders through Field and Experience," reflects a different pattern, in which accumulated professional exposure, community engagement, and diverse field experiences are the predominant reported influences. It is important to stress that these are descriptive profiles based on cross-sectional self-report data. They cannot establish causal order or confirm that one type of experience temporally precedes another. A longitudinal study would be required to test whether these profiles

represent actual developmental sequences. All of these patterns indicate that “professional development requirements” are best understood as different combinations of personal capacities, enabling environments, and opportunity structures, which vary across individuals.

4.5. Significance of the results

These findings add practical value. Their significance lies in the realization that professional development planning for talented economic leaders ought not to depend on one pathway. In other words, there is no single approach that fits everyone. Instead, development initiatives should be differentiated in multiple ways. The first practical step involves building advanced leadership stretch assignments and governance exposure. These should target individuals with strong early family nurturing. Secondly, there are those individuals who have been shaped by the academic pathway. Such leaders may benefit from structured coaching, strategic networking, and institutional sponsorship. Third, there should be a focus on formal leadership programs that consolidate learning, strengthen decision-making and organizational skills, and expand cross-sector opportunities. Such programs are suitable for people formed through experience and fieldwork. This interpretation aligns with the study’s broader conclusion that leadership development is multi-source and cumulative. More specifically, the results reflect the combined influences of family, education, and society across various life stages. This approach supports the study’s argument highlighted earlier.

4.6. Implications for professional development programs

Based on these pathways, organizations and leadership development stakeholders can strengthen talent development in three ways. These efforts can be summarized as in the following:

- To build tiered mentoring systems including early-career, mid-career, and executive mentoring. These should match each leader’s pathway;
- To increase access to structured opportunities such as rotations, strategic projects, and board or committee exposure. This will serve as a mechanism to translate talent into measurable leadership outcomes; and
- To ensure institutional policies that recognize and reward leadership growth through both formal education routes and experiential pathways.

The cluster analysis identified three distinct profiles of leadership development, characterized by early upbringing, academic pathways, and field experience (Table 5). The hierarchical cluster analysis produced three distinct leadership development profiles (Fig. 1).

5. Discussion

This study aimed to achieve two goals. The first objective was to develop and validate a domain-specific instrument measuring the professional development requirements of talented leaders in the economic field. The second involved examining how these requirements vary across demographic and career variables. The study was guided by dynamic talent development frameworks, and within this lens, leadership was understood as a manifestation of realized talent, supported by psychosocial and contextual enablers. In the current study, the researchers avoided looking at leadership as an innate trait or abstract potential. The discussion below interprets the findings in light of this framework. It focuses on scale validation, predictors of leadership development, and the identified developmental pathways.

5.1. Validation of a multidimensional framework for leadership development

The psychometric analyses yielded important results. They provided strong support for the multidimensional structure of leadership development requirements among economic leaders. The four validated dimensions namely environmental and social influence, personal skills and leadership traits, internal motivation and self-development, and innate aspects and career opportunities, align closely with contemporary talent development theory. The findings emphasize how these personal, psychosocial, and contextual factors interact to help people reach high levels of performance (Dai, 2017; Subotnik et al., 2011).

The developed questionnaire proved to be a reliable and theoretically coherent measurement framework. The high internal consistency coefficients and satisfactory confirmatory factor analysis indices showed the reliability of this scale. Importantly, environmental and social influence emerged as a distinct dimension. This result reinforces the belief of systems-oriented perspectives on talent development, which argue that excellence cannot be understood without taking into account the role of opportunity structures, institutional support, and social capital (Ziegler et al., 2019). This finding supports leadership development research proving that professional contexts play a decisive role in shaping leadership effectiveness and sustainability (Day et al., 2014).

5.2. Experience and age as statistically significant but modest predictors of leadership development

The binary logistic regression results showed that the age of individuals and their years of professional experience were the only statistically significant factors in the model. It is important to interpret this finding with appropriate caution:

while both predictors reached statistical significance, the low pseudo- R^2 values (McFadden = 0.095; Nagelkerke = 0.142) indicate that the model as a whole has modest explanatory power. The odds ratios (OR = 1.626 for age; OR = 1.460 for experience), while in the expected direction, reflect moderate effect sizes rather than strong deterministic relationships. This finding nevertheless underscores the role of accumulated experiential exposure in the manifestation of

leadership and is consistent with the view that leadership development in economic contexts is tied to prolonged engagement with complex organizational tasks, decision-making responsibility, and contextual learning opportunities. The limited variance explained also suggests that unmeasured factors, such as mentoring quality, organizational culture, and individual personality traits, likely play important additional roles.

Table 5: Clusters extracted from the data according to cluster analysis

Cluster	Profile	Distinctive features
1	Leaders with early nurturing	Family support; responsibility; intellectual independence; early business practices
2	Leaders through the academic path	Professional guidance; higher studies; scholarship; institutional trust; life experiences
3	Leaders with experience and fieldwork	Voluntary work; community engagement; diversity of experiences; openness to different environments

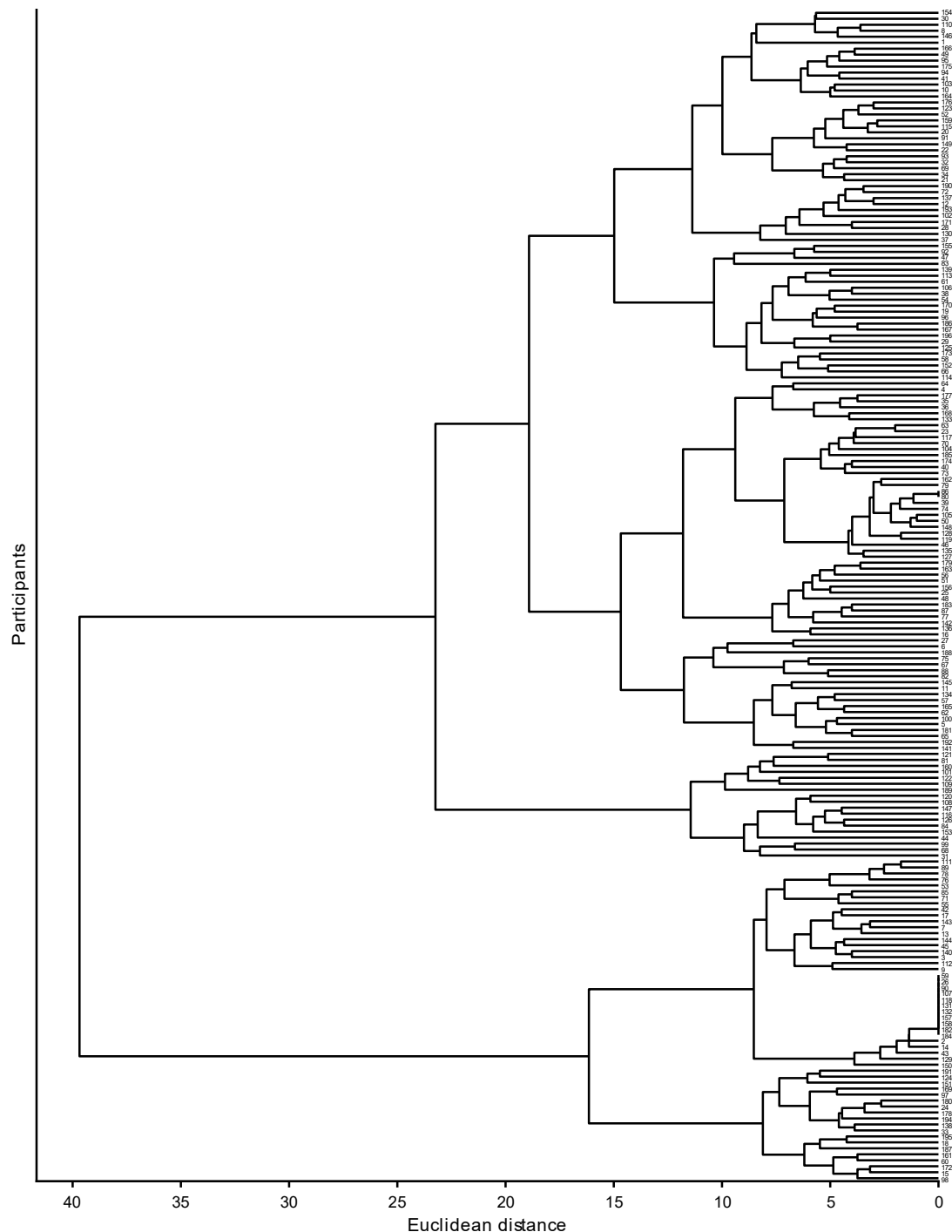


Fig. 1: Dendrogram of the identified leadership development profiles

This result is consistent with leadership development research. It points out that leadership competence is essentially developed through experience (Van Velsor et al., 2010). It also aligns with expertise research as it demonstrates that advanced performance depends largely on the extended periods of deliberate engagement as well as feedback within a particular domain (Ericsson et al., 1993). From a talent development perspective, the finding supports the view that time and experience play the role of developmental mechanisms. These catalysts enable individuals to translate earlier capacities into stable leadership outcomes (Subotnik et al., 2011).

In contrast, factors such as gender, educational level, and number of job transitions did not show a clear effect. They were not significant predictors. This unclear effect means that leadership manifestation in the economic field may be less dependent on static demographic characteristics. The manifestation of leadership is rather more strongly associated with developmental exposure and professional maturation. Notably, interpretations are limited to the measured variables. That is to say, this conclusion applies only to the factors that have been measured in the current study. Unmeasured factors such as innate ability, family background, or chance events were not examined, so they cannot be inferred from these results.

5.3. Differentiated developmental pathways to leadership

Three distinct pathways concerning leadership development were revealed in the cluster analysis. These profiles are: 1) leaders who report strong influences from early upbringing, 2) leaders who report primary shaping through academic and institutional pathways, and 3) leaders who report formation through accumulated field experience. These profiles illustrate that leadership development does not follow a single uniform pattern. In other words, they prove that there is no single path for becoming a leader. Instead, leadership reflects equifinality, where similar leadership outcomes can emerge through different developmental experiences (Lerner et al., 2015).

The “early upbringing” pathway highlights the potential influence of early responsibility-taking and socialization. This path is consistent with developmental research that considers early environmental scaffolding to be a foundation for later competence (Dai, 2017). The “academic pathway” highlights the significance of structured educational and institutional support. This second path resonates with leadership development models that emphasize mentoring, formal learning, and institutional trust (Day et al., 2014). The “experience-based pathway” underscores the value of diverse professional exposure and community engagement. It therefore aligns with evidence that leadership capability is refined through varied, real-

world challenges (Van Velsor et al., 2010). It is important to note that these clusters should be interpreted as descriptive developmental profiles in that they only describe common patterns. They do not prove that one stage causes the next stage or that everyone follows a fixed sequence. This cautious interpretation is significant. It avoids the narrative fallacy often present in retrospective leadership research. In previous studies, success is retrospectively attributed to singular pathways or traits (Taleb, 2007).

5.4. Psychosocial skills as developmental enablers

Motivation, self-development orientation, adaptability, and social engagement are the main psychosocial factors that emerged to be central components of leadership development requirements across all the confirmed dimensions and cluster profiles. These psychosocial skills are supportive resources that facilitate the emergence and stabilization of leadership outcomes rather than constituting leadership themselves. The function of these skills is consistent with the distinction made by Merello (2025) between manifestations (D) and developmental enablers (De).

This interpretation is strongly aligned with talent development theory. According to this theory, psychosocial skills become more important as individuals progress toward advanced levels of performance (Subotnik et al., 2011). Similarly, the role of self-regulation, learning orientation, and social competence in sustaining leadership effectiveness in complex organizational environments has also been highlighted in leadership research (Day et al., 2014; Mumford et al., 2000).

5.5. Implications for leadership development in economic contexts

The above findings suggest that leadership development programs in economic organizations should be differentiated. These initiatives should also be focused on experience. Due to the central role of age and professional experience, leadership programs may be most effective when they are aligned with career stage. It is envisioned that these programs may also work best when they are designed to provide progressively challenging roles, structured mentoring, and exposure to strategic decision-making. This approach and the leadership development practices emphasize experiential learning and stretch assignments (Van Velsor et al., 2010). Furthermore, the three identified pathways indicate that a “one-size-fits-all” approach to leadership development may not be effective. Development strategies should rather recognize that leaders may possibly enter advanced roles through the combinations of family socialization, academic preparation, and experiential learning. Support for them should be customized accordingly.

5.6. Methodological boundaries and future research

These findings should be interpreted within the methodological limits of the current study. The cross-sectional design precludes causal inference or conclusions about developmental sequencing. That is, the data cannot prove a relationship of cause and effect or show the exact order of development. Self-reported data may also introduce response bias. Future research should employ longitudinal designs to examine how leadership development requirements evolve over time. Future studies should also be designed to test whether distinct developmental pathways predict differential leadership outcomes under controlled program evaluations.

5.7. Limitations and future research

This study has several limitations. It is limited by its reliance on self-reported questionnaire responses. This may introduce response bias. It can also make associations among constructs appear stronger than they really are. Furthermore, while the study adopts a measurement-based approach to mitigate the narrative fallacy, cluster profiles are still based on leaders' retrospective self-reports about family upbringing, education, and career experiences. Leaders may selectively recall or reframe past experiences in ways that are consistent with their current identity, meaning the narrative fallacy is reduced but not eliminated. Longitudinal or mixed-methods designs would help address this limitation. Additionally, the cross-sectional design captures relationships at one time point, and it cannot therefore confirm causal directions between personal and contextual factors and leadership development outcomes. The sample of this study was drawn from leaders within the economic field in Saudi Arabia. Since the study covers only the Saudi context, the findings may limit generalizability to other sectors or countries that may have different organizational cultures and opportunity structures. Future studies should use longitudinal designs to track the trajectories of leadership development over time. Moreover, they should examine the possibility that family-based, academic-based, and experience-based pathways might lead to differential leadership outcomes under controlled program evaluations.

The findings suggest that leadership development initiatives in economic organizations should be differentiated based on a person's career stage. As pointed out already, age and years of professional experience were the only significant predictors in the regression model within the sample of the current study. Practically, organizations can take three steps. These are:

- Implement structured, progressive leadership pathways that align training intensity and role complexity with experience accumulation. By way

of example, they can implement early-career leadership fundamentals, mid-career strategic leadership, senior-level governance, and risk oversight.

- Priority should be given to practical learning opportunities. For instance, organizations can focus on job rotations, challenging assignments, cross-functional projects, and crisis simulations. Such mechanisms can assist them in turning accumulated experience into actual leadership ability.
- Establish mentoring and sponsorship programs. This will help us to ensure that developmental exposure becomes available to everyone rather than being dependent on informal access. Like the measurement-based framework of the current study, these recommendations emphasize the combined contribution of environmental and social influences, personal leadership traits, and internal motivation and self-development to professional leadership development.

6. Conclusion

This study developed and validated a domain-specific measurement instrument. It aimed to examine the professional development requirements of talented leaders in the economic field through the use of this designed questionnaire. Guided by a talent development framework, leadership in this study was framed as a manifestation of realized talent. Psychometric analyses supported a multidimensional structure made up of various dimensions. These encompassed environmental and social influences, personal leadership traits, internal motivation and self-development, and career-related opportunity structures.

The findings showed that leadership profiles varied across the sample, reflecting distinct patterns of reported developmental influences. These trajectories are reflections of different combinations of personal and contextual resources. Age and years of professional experience were identified as the only significant predictors. This finding further highlighted the importance of accumulated experiential exposure in the manifestation of leadership. Gender and educational level, however, showed no significant effects.

Theoretically, the main contribution of this study lies in clarifying the difference between leadership itself and the psychosocial skills that support its development. The study showed this distinction in a real-world economic context, Saudi Arabia. Practically, the validated framework offers a foundation for targeted leadership development planning. It also provides a useful tool for future longitudinal studies that aim to understand how talent is transformed into sustained leadership performance over time.

List of abbreviations

AIC Akaike information criterion

β	Beta coefficient
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CMA	Capital market authority
CMIN/DF	Chi-square/degrees of freedom ratio
D	Manifestations
De	Developmental enablers
EFA	Exploratory factor analysis
GFI	Goodness-of-fit index
KMO	Kaiser-Meyer-Olkin measure
N	Sample size
OR	Odds ratio
p	p-value
R^2	Coefficient of determination
R^2_{McF}	McFadden's pseudo- R^2
R^2_N	Nagelkerke's pseudo- R^2
RMSEA	Root mean square error of approximation
SE	Standard error
χ^2	Chi-square statistic
z	z statistic

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Compliance with ethical standards

Ethical considerations

Ethical approval was obtained from the Institutional Review Board of King Faisal University (KFU-REC-2024-AUG-ETHICS2457, August 12, 2024). The study was conducted in accordance with the Declaration of Helsinki. Participation was voluntary, and informed consent was obtained from all participants. Responses were anonymous and confidential, with no personally identifiable or organizational information collected. Participants were informed of their right to withdraw at any time without penalty. Data were securely stored and used solely for research purposes.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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